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DRAFT: FOR DISCUSSION PURPOSES ONLY

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 10/560,301

Confirmation No.: 3208

Applicants: Jun Keun CHANG et al.

Art Unit: 1775

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Examiner: William H. Beisner

For: ELECTROPORATOR HAVING AN
ELONGATED HOLLOW MEMBER

Docket No.: LT00012 US

Customer No.: 52059

Draft: Claim Amendments

IN THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in the case.

1.-17. (Canceled)

18. (Original) An electroporation apparatus for applying an electric pulse or electric pulses to a specimen including cells to thereby electroporate cell membranes and infuse foreign materials into the cells, comprising:

a long hollow specimen-stuffing member of non-conductive material;

a reservoir connected to a distal end of the specimen-stuffing member for fluid communication; and

a pressure maintaining means connected to the other distal end of the specimen-stuffing member for fluid communication.

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19. (Previously Presented) The electroporation apparatus according to claim 18, wherein the specimen-stuffing member has a ratio (R, cm^{-1}) of a longitudinal length (L, cm) to horizontal cross-sectional area (A, cm^2) in the range of 50 to 10,000.
20. (Previously Presented) The electroporation apparatus according to claim 18, wherein the hollow specimen-stuffing member is a capillary, a tubing or a channel.
21. (Previously Presented) The electroporation apparatus according to claim 18, wherein the pressure maintaining means is connected by a connector disposed with an electrode insertion unit for inserting an electrode.
22. (Original) The electroporation apparatus according to claim 21, wherein the electrode is inserted into the electrode insertion unit for applying electric pulses, and the electrode contact the specimen if the specimen-stuffing member is filled therein with the specimen.
23. (Original) The electroporation apparatus according to claim 21, wherein the connector is a disc for forming a hole therein for passing the specimen, and the electrode insertion unit is formed at a lateral surface of the disc.
24. (Previously Presented) The electroporation apparatus according to claim 18, wherein the pressure maintaining means is a pump, a syringe or a pipette.
25. (Currently Amended) An electroporation apparatus for applying an electric pulse or electric pulses to a specimen including cells to thereby electroporate cell membranes and infuse foreign materials into the cells, comprising:
- a long hollow specimen-stuffing member of non-conductive material;
 - a pressure maintaining means connected to a distal end of the specimen-stuffing member for fluid communication;

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a reservoir connected to the other distal end of the specimen-stuffing member for fluid communication and disposed with an electrode for contacting the specimen or an electrolytic solution; and

a reservoir holder including a fixing unit for fixing the pressure maintaining means, an electrode terminal for electrically connecting the fixing unit to the pressure maintaining means and another electrode terminal for electrically connecting the electrode disposed at the reservoir.
(pages 15- page 18 FIGS 3-12)

26. (Currently Amended) The electroporation apparatus according to claim 25, wherein the pressure maintaining means is a pipette in which a conductive contact is disposed at part of the pipette body thereof and a movable electrode is inserted into the conductive contact for communication with a piston the movable electrode also inserted into the specimen stuffing member for fluid communication and for contacting the specimen or an electrolytic solution disposed in the specimen stuffing member. the pipette in electrical connection with the movable electrode through the conductive contact and wherein the hollow specimen-stuffing member is directly attached and detached to a tip mounting shaft of the pipette.

27. (Previously Presented) The electroporation apparatus according to claim 25, wherein the hollow specimen-stuffing member is a capillary or a tubing.

28. (Previously Presented) The electroporation apparatus according to claim 25, wherein the specimen-stuffing member has a ratio (R, cm^{-1}) of a longitudinal length (L, cm) to horizontal cross-sectional area (A, cm^2) in the range of 50 to 10,000.

29 – 42. (Cancelled)

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43. (Previously Presented) An electroporation system for introducing foreign materials into cells by electroporating cell membranes by way of applying an electric pulse or electric pulses to a specimen including the cells, comprising:

the electroporation apparatus according to claim 18; and

a pulse generator for generating an electric pulse,

the reservoir is disposed with an electrode contacting the specimen or an electrolytic solution, the specimen-stuffing member is filled with the specimen by the pressure maintaining means, the specimen or the electrolytic solution filled in the reservoir is connected to a distal end of the specimen-stuffing member for fluid communication, and an electric pulse or electric pulses are applied to an electrode contacting the specimen or the electrolytic solution filled in the reservoir and another electrode inserted into an electrode insertion unit of the connector to thereby electroporate the cells in the specimen filled in the specimen-stuffing member.

44. (Previously Presented) The electroporation apparatus according to claim 26, wherein the movable electrode is a plastic of which surface is coated with conductive material.

45. (Previously Presented) An electroporation system for introducing foreign materials into cells by electroporating cell membranes by way of applying an electric pulse or electric pulses to a specimen including the cells, comprising:

the electroporation apparatus according to claim 25; and

a pulse generator for generating an electric pulse,

wherein the pressure maintaining means is a pipette disposed at part of the body thereof with a conductive contact, and a movable electrode disposed inside the specimen-stuffing member is inserted for communication with a piston, and

wherein the hollow specimen-stuffing member is directly detached and attached to a tip mounted shaft of the pipette, the movable electrode is raised or lowered to a distal end of the specimen-stuffing member by a depression button of the pipette to fill the specimen in the specimen-stuffing member or retrieve it, the pipette is inserted and fixed to a reservoir holder

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inner pipe, a contact of the pipette body is electrically connected to the electrode terminal via the fixing unit of the reservoir holder inner pipe, the specimen-stuffing member is so positioned as to fluidly communicate with the specimen or the electrolytic solution stored in the reservoir, and an electric pulse or electric pulses are applied to the electrode contacting the specimen or the electrolytic solution stored in the reservoir to thereby electroporate the cells in the specimen filled in the specimen-stuffing member.

46 – 47. (Cancelled)